

MRI of Central Nervous System Paracoccidioidomycosis (PCM)

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Introduction

The actual frequency of paracoccidioidomycosis of the central nervous system (CNS) is not known, because neurological investigation of the patients is not routinely done and in many cases the CNS involvement may be silent [1]. The incidence of CNS involvement in several studies varied from 10 to 27 % [2]. Of the relatively small number of cases reported in the literature, the two most common clinical presentations are the meningeal and pseudotumoral (parenchymatous) forms, being the last most common. The granulomatous lesions may be single or multiple, with various sizes, and have been described predominantly in brain hemispheres in relation to the cerebellum and the brain stem. In addition, most cases were associated with PCM involvement of other organs, mainly lungs [3]. MRI has been shown superior to CT in the evaluation of neuroparacoccidioidomycosis [4], but only a small number of cases has been studied by MRI.

The first aim of this study was to assess the frequency of CNS lesions in a series of PCM patients consecutively diagnosed at a Brazilian reference center. In addition, this study was also designed to characterize better the imaging features and the preferential localization of PCM lesions of the CNS.

Patients and methods

Twenty-one patients, aged 21 to 69 years (mean 49.2 and standard deviation 10.9 years) with clinical, serological and anatomic-pathological diagnosis of PCM were submitted to MRI of the brain on a Philips 1.5 Tesla Gyroscan ACS III scanner. Imaging protocol consisted of spin-echo axial T1-weighted (TR: 510 ms, TE: 15 ms) and T2-weighted (TR: 2500 ms, TE: 25/90 ms), turbo-spin-echo axial FLAIR (TR: 8000 ms, TE: 150 ms, TI: 2300 ms) and turbo-spin-echo T2-weighted coronal (TR: 3000 ms, TE: 120 ms) 6 mm images with 0.6 mm gap. Following intravenous Gd-DTPA injection, axial, coronal and sagittal spin-echo T1-weighted images were obtained.

Results

Of the 21 patients evaluated, only 2 presented neurological manifestations at admission; both had signs and symptoms of intracranial hypertension and one of them had, in addition, hemiparesis. All patients had concomitant involvement of a distant organ, mainly the lungs, that lead to the clinical suspicion of PCM.

SNC lesions were depicted by MRI in 10 patients. Thus, SNC involvement was detected in 8 patients with no neurological signs or symptoms. Four patients presented with single lesions, and 6 with multiple lesions. Three patients had 4 or more lesions.

The lesions consisted of nodules, most of them with hypo or isointense center on T1-weighted images, hypointense on T2-weighted and FLAIR and with thin annular enhancement following IV Gd-DTPA infusion (Fig. 1 A and B). Therefore, the aspect of the lesions is compatible with the chronic granulomatous reaction elicited by the fungal dissemination in this mycosis. In 7 lesions we also detected internal hyperintense foci.

Out of 31 lesions identified by MRI, 19 were supratentorial and 12 infratentorial. Four patients had only supratentorial lesions, 2 had only infratentorial lesions and 4 had lesions at both locations. Distribution of the lesions was not homogeneous. Eight of the lesions were detected in the cerebellum, 2 in the brain stem, 3 in

basal ganglia/ insula/ internal capsule and 16 in the cerebral hemispheres. The frontal and occipital regions were the most affected areas, with 6 lesions each. In 9 lesions, no peripheral edema was observed. Seven lesions presented with linear edema, 3 with discrete, 8 with moderate and 4 with marked edema. One patient presented with a frontal dural-based lesion, with a "dural tail" sign after IV Gd-DTPA injection. In four patients, a larger lesion with small surrounding satellite lesions was observed.

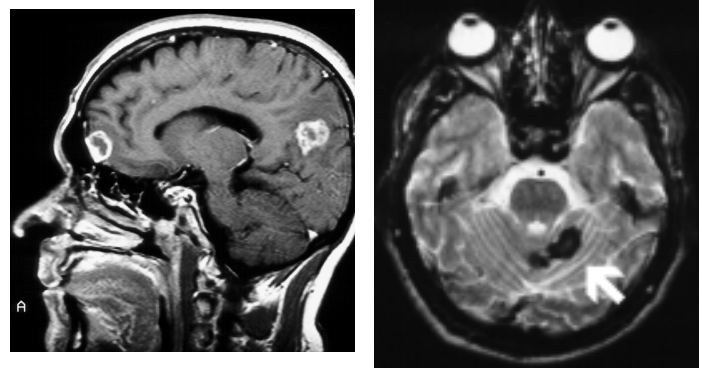


Fig.1

A

B

A) Sagittal T1-weighted image following IV Gd-DTPA infusion. Frontal and parieto-occipital granulomas with peripheral enhancement. B) Another patient, axial T2-weighted image showing hypointense cerebellar granulomas (arrow)

Conclusions

- 1) CNS involvement appears to be more frequent than previously thought.
- 2) CNS involvement is silent in the majority of the patients.
- 3) CNS lesions aspect is suggestive of granulomatous reaction with central necrosis.
- 4) Features detected in some lesions in this study, such as the presence of lesions with smaller satellite lesions and nodular lesions with hypointense center and ring-like enhancement, may be peculiar of PCM.
- 5) Differently than previously suggested, we observed that a) lesions affected almost equally infra- and supratentorial areas; b) the cerebellum was frequently involved
- 6) In the cerebral hemispheres, lesions preferentially affected the occipital and frontal areas.

References

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